CARBONATED DRINKS
Poison in Disguise?

Fizzy soft drinks, caffeinated colas and energy drinks contain a variety of harmful ingredients with detrimental side effects, and their consumption should be discouraged.

by Charu Bahri
© December 2006

Email: charubahri@gmail.com

We have come a long way since 1798, the year when the term "soda water" came into existence.[1] In fact, it took nearly another century for Charles Aderton of Waco, Texas, to invent the Dr Pepper soft drink in 1885. However, nowadays we are bombarded with a wide range of carbonated beverages being successively launched in global markets. These drinks are in many ways taking the place of traditional foodstuffs, thus causing a major health crisis.

First things first. A look at the health fallouts of carbonated beverages must start by explaining what these are. Carbonated beverages, popularly known as soft drinks, fizzy drinks, sodas or soda pops, are drinks that contain dissolved carbon dioxide. The process of dissolving carbon dioxide in water, called carbonation, adds "fizz" to the drink.

Soft drink consumers typically associate fizz with the bubbles present in the beverage that escape from the drink or appear as emulsions at the top of the bottle or can when it is opened as the carbon dioxide present within is depressurised. However, contrary to popular belief, the fizzy taste of most carbonated drinks is caused by the dilute carbonic acid inducing a slight burning sensation and is not caused by the presence of bubbles. This can be shown by drinking a carbonated drink in a hyperbaric (pressurised) chamber at the same pressure as the beverage. This gives much the same taste, but the bubbles are completely absent.[2]

So much for their taste. What about their contents, aside from the dissolved carbon dioxide? An article titled "The Real Dangers of Soda to You and Your Children" by Dr Joseph Mercola with Rachael Droege indicates that one can of soda has about 10 teaspoons of sugar, 150 calories and 30–55 mg of caffeine, and is loaded with artificial food colours and sulphites.[3]

A not-so-sweet habit

Consider the sugar component first. Apparently, soft drink manufacturers are the largest single users of refined sugars in the United States. In fact, most sodas contain over 100 per cent of the RDA (recommended daily allowance) of sugars. No wonder, then, that carbonated soft drinks are the largest single source of calories in the American diet, providing about seven per cent of calories—a figure which increases to nine per cent when non-carbonated drinks are included as well. For teenagers, this figure zooms to 13 per cent of the total calorie intake considering both carbonated and non-carbonated soft drinks. While consumption of carbonated soft drinks in the USA in 2004 declined by seven per cent since 1998 when the figure stood at 56.1 US gallons [212.6 litres] per person per year, most Americans still consume far too many carbonated drinks.[4]

According to the US National Soft Drink Association (NSDA), consumption of soft drinks is now over 600 12-fluid-ounce [355 mL] servings per person per year. Apparently, soda consumption in the USA has tripled for boys and doubled for girls since 1978. Young males aged 12 to 29 are the biggest consumers at over 160 gallons [606.4 litres] per year, almost two quarts [~1.9 litres] per day.[5]

The situation in the UK is not much better, either. Apparently, more than 5,560 million litres of carbonated soft drinks are consumed every year in the United Kingdom.[6] Considering that the UK has a population of around 60.2 million, this implies a per-person consumption of over 92 litres per year.

Australia is not far behind, either. Consumption data from the Australian Bureau of Statistics as well as industry data suggest that the intake of soft drinks in Australia has grown rapidly in the past 30 years from around 47.3 litres per person per year in 1969 to

113 litres per person (children and adults) in 1999.[7] When it comes to refined sugars, soft drink manufacturers since the 1970s have been opting to use high-fructose corn syrup (HFCS), a combination of fructose and dextrose, as opposed to sucrose from sugar cane. High-fructose corn syrup has been associated with poor development of collagen in growing animals, as it interferes with the absorption of copper. Further, since fructose must be metabolised by the liver, animals on high-fructose diets have been found to develop liver problems akin to those developed by alcoholics. HFCS may also be associated with diabetes and obesity. Diabetics and others who must monitor their blood sugar levels may not get accurate glycaemic readings after consuming fructose, which in the case of high-fructose corn syrup is highly processsed and hardly "natural".[8]

With such high consumption levels of these sugary drinks, there is much more to be concerned about.

Yellow teeth, anyone?

Another consequence of a high intake of soft drinks is the loss of tooth enamel, causing yellow teeth and tooth rot. The culprit is the phosphoric acid in soft drinks, which is also thought to have an adverse impact on digestion.

Why does phosphoric acid cause this fallout? The body tries to maintain the normal pH level of saliva as slightly alkaline, or more specifically at 7.4. However, since soft drinks are extremely acidic—considered to measure 2.0 on the pH scale, or to be about 100,000 times more acidic than pure water[9]—when they are consumed frequently they leave an acidic residue in the mouth which lowers the saliva's natural alkalinity.

This imbalance activates the body's natural repair systems. In order to reverse the acidic pH level, the body uses calcium ions available in the teeth, thus depleting tooth enamel. Apparently, even drinks labelled "sugar free", "reduced sugar" or "low sugar" can contain enough sugar to cause damage to teeth, in addition to having the same acids as the standard carbonated drinks.[10] These acids may cause inflammation of the stomach and duodenal lining, and over a longer period of time they can lead to gastric lining erosion. Far worse, the buffering of acidity throughout the body—which becomes essential when an acidic environment continuously prevails—is thought to contribute to bone loss.

"In the interests of global warming, we are initiating an international ad campaign encouraging our customer base to refrain from burping."

Colas linked to bone fractures and osteoporosis

An article by Grace Wyshak, associate professor in the Departments of Biostatistics and Population and International Health at the Harvard School of Public Health, published in the June 2000 issue of the *Archives of Pediatric and Adolescent Medicine* highlights that active girls who drink cola drinks are five times more likely to have had bone fractures than girls who don't drink carbonated beverages.[11] Wyshak's study was based on an analysis of data drawn from more than 460 ninth- and tenth-grade girls who reported their activity levels, carbonated beverage drinking habits and history of bone fractures.

This study succeeds two earlier attempts by Wyshak to examine the link between carbonated beverages consumption, physical activity and bone fractures, both of which yielded similar outcomes as published in the *Journal of Orthopedic Research*[12] and the *Journal of Adolescent Health.*[13]

Evidently, nutritional choices affect health and, as this case indicates, bone health. The US National Osteoporosis Foundation indicates that approximately 55 per cent of Americans, mostly women, are at risk of developing osteoporosis, which makes this question all the more pertinent: are colas in any way linked to the development of osteoporosis?

A report published in the October 2006 issue of the *American Journal of Clinical Nutrition* cites a recent epidemiological research study by Katherine Tucker, PhD, Director of the Epidemiology and Dietary Assessment Program at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University, and colleagues which presents convincing evidence that the intake of colas is also linked with lower bone mineral density in older women, which in turn increases the risk of osteoporosis.[14] Tucker and her colleagues conducted the Framingham Osteoporosis Study by correlating dietary responses and bone mineral density measurements at the spine and three different hip sites of more than 2,500 people whose average age was just below sixty. They found that cola consumption was associated with lower bone mineral density—almost four per cent less—at all three hip sites in women, irrespective of the respondent's age, menopausal status, total calcium and vitamin D intake, or use of cigarettes or alcohol.

Interestingly, the team also found that cola consumption was not associated with lower bone mineral density for men at the hip sites or the spine for either men or women. The results were similar for diet cola and, although weaker, for decaffeinated cola as well.

Male respondents in the Framingham Osteoporosis Study reported consuming an average of six carbonated drinks a week, with five being cola, and female respondents reported drinking an average of five carbonated drinks a week, four of which were cola. A serving size was defined as one bottle, can or glass of cola. Since the findings do not correlate bone mineral density loss in women with the consumption of non-cola carbonated beverages, let's consider the probable reasons for the outcome.

This study noted that more than 70 per cent of the carbonated beverages consumed by the subjects were colas, all of which contain phosphoric acid, an ingredient that is not likely to be found in non-cola carbonated beverages. A typical can of cola or one 12-fluid-ounce serving contains

44–62 mg of phosphoric acid, which can interfere with bone absorption of calcium and cause the leaching of calcium from bones to help neutralise the acid.[15]

Tucker, the study's corresponding author, explains this well: "Physiologically, a diet low in calcium and high in phosphorus may promote bone loss, tipping the balance of bone remodeling toward calcium loss from the bone. Although some studies have countered that the amount of phosphoric acid in cola is negligible compared to other dietary sources such as chicken or cheese, further controlled studies should be conducted to determine whether habitual cola drinkers may be adversely affecting their bone health by regularly consuming doses of phosphoric acid that do not contain calcium or another neutralizing ingredient."[16]

Dr Mone Zaidi, director of the Mount Sinai Bone Program at Mount Sinai School of Medicine in New York City, notes that the Framingham findings also pose a problem for younger women who stand never to develop peak bone density. In his words: "Younger women who have a lot of coke will not form bone to an extent their peers would; so, years later, in menopause, they are going to be disadvantaged."[17]

In 1998, Dr Bess Dawson-Hughes, a bone disease expert at the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston, forewarned: "I'm particularly concerned about teenage girls. Most girls have inadequate calcium intakes, which makes them candidates for osteoporosis when they're older and may increase their risk for broken bones today. High soda consumption is a concern because it may displace milk from the diet in this vulnerable population."[18]

Dr Dawson-Hughes's concerns were not unfounded. The "Liquid Candy" report published in 1998 by the non-profit Center for Science in the Public Interest (CSPI), also the publisher of the *Nutrition Action Healthletter*, stated that teenage boys and girls drink twice as much soda pop as milk, whereas 20 years previously they drank nearly twice as much milk as soda.[19]

A University of North Carolina study also highlights that from 1965 to 1996, adolescent milk consumption dropped 36 per cent while adolescent soft drink consumption more than doubled.[20]

From 1985 to 1997, school districts decreased the amounts of milk they bought by nearly 30 per cent and increased their purchases of carbonated sodas.

Empty calories, reduced appetites

It's not as though teens or even adults are to blame for failing to eat well at mealtime. Soft drink conglomerates and even some medical studies are always quick to shift the onus for lower bone mass to soft drink consumers, by proclaiming that soft drinks are not to blame if people do not eat well. However, they conveniently overlook the fact that the empty calories ingested from carbonated beverages throughout the day often serve to reduce appetites, leading to poor eating at mealtime.

This problem is exacerbated in the case of teens, and as Greg Critser explains in *Fat Land: How Americans Became the Fattest People in the World*: "A joint study by Harvard University and Boston Children's Hospital researchers in February 2001 concluded that such excess liquid calories inhibited the ability of older children to compensate at mealtime, leading to caloric imbalance and, in time, obesity."[21]

Back in 1998, Michael F. Jacobson, executive director of CSPI, warned: "Many teens are drowning in soda pop. It's become their main beverage, providing many with 15% to 20% of all their calories and squeezing out more-nutritious foods and beverages from their diets."[22]

Sadly, most of this consumption is taking place in schools. Marion Nestle's book *Food Politics* points out that while soft drinks have replaced milk in the diets of many American children as well as adults, school purchases reflect such trends. From 1985 to 1997, school districts decreased the amounts of milk they bought by nearly 30 per cent and increased their purchases of carbonated sodas.[23]

Targeting and taking advantage of schoolchildren

The reason for schools buying such excessive quantities of soft drinks is rooted in another factor. Since school budgets often fall short in being able to support all school activities, especially recreational, extracurricular and sporting, schools sign contracts with soft drink giants. For instance, in 1993, District 11 in Colorado Springs became the first public school district in the USA to place ads for Burger King in its hallways and on the sides of its school buses. A few years later, the school district signed a 10-year deal with Coca-Cola, bringing in US$11 million during the life of the contract.[24] These contracts specify annual sales quotas, with the result that school administrators encourage students to drink sodas even in their classrooms. As such contracts are increasingly coming into the limelight, school administrations are being slammed for selling out to cola companies.

Marianne Manilov, executive director of the Center for Commercialism-Free Public Education, based in Oakland, California, castigated schools for "...sacrificing their students' health by selling out to Coca-Cola. The marketing agreements virtually ensure that more kids will be drinking more soda—while their health classes are discouraging consumption. Taxpayers must provide school systems with adequate funds so that schools don't become reliant on junk-food companies."[25]

Cola companies are not only targeting schools. Coca-Cola is said to have paid the Boys & Girls Clubs of America $60 million to make its company's products the only brands sold in more than 2,000 clubs. The contract outlays may seem hefty, but, in spite of this, cola companies are currently having the last laugh. When a company like Coca-Cola, for example, sets its growth rate at a minimum of 25 per cent per annum, it needs to identify potential consumer sectors to tap into. Since the adult market is relatively stagnant, children become the target. According to an article in *Beverage* (January 1999): "Influencing elementary school students is very important to soft drink marketers."[26]

A few campaigners are trying to spread awareness of their concerns. San Francisco's school district banned exclusive contracts for soda and junk food in 1999, but few areas have followed their example. Former California State Assembly member Kerry Mazzoni has even tried to push through a bill banning exclusive beverage contracts—which she calls "selling your children to the highest bidder"—in schools throughout the

FAR FROM SOFT!

In *The ADD Nutrition Solution: A Drug-Free 30-Day Plan*, Marcia Zimmerman, CN,[57] points out that sodium benzoate, used as a preservative (for microbial control) in foods such as soft drinks, fruit juices, margarines, confections, pickles and jams, results in adding sodium to the diet, thus reducing the availability of potassium. Some reported reactions to sodium benzoate include recurring urticaria (rash), asthma and eczema.

Artificial colourings, especially Yellow No. 5, promote attention deficit hyperactivity disorder (ADHD) in some children. Yellow No. 5 also causes hives, asthma and other allergic reactions in a small number of individuals. Artificial flavours may also contain traces of MSG, a neurotoxin.

Soft drinks are said to increase the recurrence of kidney stones. Hence, the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) includes colas on a list of foods that patients should avoid to prevent the recurrence of stones.[58]

State, but she has had to settle for a law requiring school boards to hold public hearings before signing such contracts.[27]

Likewise, Senator Patrick Leahy (D-Vermont) introduced a bill in April 2001 requiring the USDA to rule within 18 months on banning or limiting the sale of soda and junk food in schools before students have eaten lunch. However, the bill was never passed into law.[28]

Alternatively, some social watchers point to a rule introduced in The Philippines whereby every litre bottle of carbonated soft drink sold is taxed. They suggest that the tax collected from such sales should be distributed to augment dwindling school budgets.[29]

... low-sugar drinks such as diet sodas using artificial sweeteners come laden with aspartame, a chemical considered a potent neurotoxin and an endocrine disrupter.

Pesticides in your soft drinks

Quite aside from soft drinks being associated with nutritional deficiencies, the water used to manufacture soft drinks may contain excessive fluoride levels and other contaminants. In the USA, tap water, the main ingredient of bottled soft drinks, can contain chemicals such as chlorine, trihalomethanes, lead, cadmium and various organic pollutants.[30]

This problem is only compounded in developing countries. In India, for instance, the Centre for Science and Environment (CSE), an independent public-interest organisation, has detected a higher level of pesticides in certain soft drinks—yet, in spite of three years of deliberations and 20 meetings, the Bureau of Indian Standards (BIS) has still not finalised the standards for soft drinks. Instead, television viewers are being served a plethora of new advertising segments featuring leading film stars contracted as brand ambassadors advising consumers that the relevant soft drink is absolutely safe to drink.[31]

The CSE particularly notes that "international standards for pesticide residue all over the world (including the US and EU) recognise the trade-off between pesticides and nutrition. Fruits and vegetables have nutrition. They give us something in this poison–nutrition trade-off. We get nothing with colas. Just pesticides."[32]

Why consume junk that offers no nutrition?

This pretty much sums up the moot point. Why should we drink stuff that offers us no nutritional value but, instead, leads to a number of health ailments? Is our increasing fondness for soft drinks of every kind merely rooted in a lack of awareness? Perhaps advisories recommending that consumers avoid soft drinks no longer make their way to the mainstream media?

Apparently, in 1942, the American Medical Association's Council on Food and Nutrition made the following statement: "From the health point of view it is desirable especially to have restriction of such use of sugar as is represented by consumption of sweetened carbonated beverages and forms of candy which are of low nutritional value. The Council believes it would be in the interest of the public health for all practical means to be taken to limit consumption of sugar in any form in which it fails to be combined with significant proportions of other foods of high nutritive quality."[33]

The bottom line is that soft drinks, including energy drinks, offer practically nothing by way of nutrition. The calories ingested, because of their sugar content, are rightly termed "empty calories" that contribute to weight gain and, eventually, obesity. Given the high per-capita consumption of colas in the USA, it therefore comes as no surprise that recent research indicates that half of American adults and one in three American children is overweight.[34] Even worse, a modern lifestyle entailing a large consumption of soft drinks is further linked to an early onset of lifestyle-related diseases such as diabetes, cardiac ailments, heart attacks, strokes and cancer.[35]

Aspartame: a deadly toxin

Consumers should also know that low-sugar drinks such as diet sodas using artificial sweeteners may promise fewer calories but come laden with aspartame, a chemical considered a potent neurotoxin and an endocrine disrupter. Besides being associated with a multitude of health side effects such as brain tumours, birth defects, diabetes, emotional disorders and epilepsy/seizures, aspartame when stored for long periods of time or kept in warm areas changes to methanol, an alcohol that converts to formaldehyde and formic acid which are known carcinogens.[36]

In her book *The Crazy Makers*, Carol Simontacchi points this out: "One liter of an aspartame-sweetened beverage can produce about fifty-six milligrams of methanol. When several of these beverages are consumed in a short period of time (one day, perhaps), as much as two hundred [and] fifty milligrams of methanol are dumped into the bloodstream, or thirty-two times the EPA limit."[37]

Besides aspartame, the artificial sweetener saccharin, which is now used only in a few brands, has been linked in human studies to urinary/bladder cancer and in animal studies to cancers of the bladder and other organs.[38] Acesulfame-K, which is used in the new Pepsi One, is currently considered safe for use, but who knows what future research may throw up?[39]

Overdosing on extreme energy drinks

Recent research findings presented at the annual scientific assembly of the American College of Emergency Physicians in New Orleans also question the energy offered by so-called energy

drinks. Over three years, Dr Danielle McCarthy and her colleagues at Northwestern University collated the incoming call data of the Illinois Poison Center in Chicago.[40] The research team specifically focused on calls related to caffeine medications and dietary supplements, not on coffee or tea products.

Their findings are startling, to say the least. Apparently, more than 250 cases of medical complications from ingesting caffeine supplements came into the poison centre. Twelve per cent or 31 cases required hospitalisation, of which 20 cases needed treatment in an intensive care unit. More pointedly, the average age of the caffeine abusers was twenty-one. A surprising number of caffeine overdoses involved young people taking alertness pills such as NoDoz or energy drinks, sometimes mixed with alcohol or other drugs. This study goes a long way in highlighting the general social ignorance of the medical side-effects of caffeine supplements. As Dr McCarthy warns: "Young people taking caffeine, either to stay awake or for a feeling of euphoria, may actually end up in the emergency department more often than we think. Young people being hospitalized for chest pains and heart palpitations are rarely asked if they've taken caffeine supplements because everyone perceives them to be safe."[41]

... the Irish government had ordered "urgent research into the effects of so-called 'functional energy' or stimulant soft drinks after an inquest jury recommended urgent research".

In fact, most people would assume that the young adults who had abused caffeine would also have consumed other "poisonous" substances. Not quite, as the study found that caffeine alone was abused in 68 per cent of the cases recorded. While it is true that most of the cases requiring hospitalisation involved the combined abuse of caffeine along with a pharmaceutical product, it is disturbing to note that an overdose of a substance like caffeine, which most of us associate as a food product, can invoke a serious medical reaction. In this case, stimulant soft drinks, also known as energy drinks, which contain a higher-than-usual level of caffeine, have been brought under the microscope.

Dangers of mixing alcohol and stimulant drinks

In fact, as far back as December 2000, *The Lancet*[42] published an article by Karen Birchard which mentioned that the Irish government had ordered "urgent research into the effects of so-called 'functional energy' or stimulant soft drinks after an inquest jury recommended urgent research". The reason behind the call for an investigation was the case of an 18-year-old who died while playing basketball. He had consumed three cans of Red Bull, a stimulant soft drink.

The *Lancet* article also noted that stimulant drinks are a popular mixer for vodka among young drinkers. Further, when persons already drowsy from consuming excessive alcohol switch to stimulant drinks, they tend to display aggressive behaviour traits, even leading to late-night violence. Apparently, this problem had been so widespread that it prompted certain Irish establishments to refuse to sell stimulant drinks. At the same time, according to the *Lancet* article, the European Union Commissioner for Health and Consumer Protection, David Byrne, backed the inquest jury's recommendation for research into stimulant drinks, saying he had asked the EU's scientific committee to look again at stimulants and their effect on the body.

In response to the government's request, *Safe*Food, the Food Safety Promotion Board, established a Stimulant Drinks Committee to commission independent scientific research into the health effects of stimulant drinks. As detailed by Derek Finnegan in an article in *Nutrition Bulletin*,[43] the report published by this committee in March 2002 recommended that stimulant drinks should be labelled with an indication that they are unsuitable for

Endnotes

1. http://inventors.about.com/library/weekly/aa091699.htm
2. http://en.wikipedia.org/wiki/Carbonation
3. Mercola, Joseph (Dr) with Rachael Droege, "The Real Dangers of Soda to You and Your Children", http://www.mercola.com/2003/jul/9/soda_dangers.htm
4. CSPI (Center for Science in the Public Interest), "Liquid Candy: How Soft Drinks Are Harming America's Health", http://www.cspinet.org/liquidcandy/
5. Valentine, Judith, PhD, CNA, CNC, "Soft Drinks: America's Other Drinking Problem", http://www.westonaprice.org/modernfood/soft.html
6. Greenhalgh, Alyson, "Carbonated soft drinks", http://www.bbc.co.uk/health/healthy_living/nutrition/drinks_soft2.shtml; http://www.statistics.gov.uk/CCI/nugget.asp?ID=6
7. Gill, Timothy P., Anna M. Rangan and Karen L. Webb, "The weight of evidence suggests that soft drinks are a major issue in childhood and adolescent obesity", *The Medical Journal of Australia*, 2006; 184(6):263-64, http://www.mja.com.au/public/issues/184_06_200306/0_i1091587#0_i1091587
8. Gazzaniga, Marin, "Sickeningly Sweet: The Effects of High-Fructose Corn Syrup", MSN Health & Fitness, http://health.msn.com/centers/diabetes/articlepage.aspx?cp-documentid=100118604; Bray, George A., Samara Joy Nielsen and Barry M. Popkin, "Consumption of high-fructose corn syrup in beverages may play a role in the epidemic of obesity", *Am. J. Clin. Nutrition* 79(4):537-543, April 2004, http://www.ajcn.org/cgi/content/full/79/4/537; http://www.wisegeek.com/what-is-high-fructose-corn-syrup.htm
9. Focus-On-Nutrition.com, "Carbonated Beverages", http://www.focus-on-nutrition.com/sodas.shtml
10. Greenhalgh, "Carbonated soft drinks", op. cit.
11. Harvard School of Public Health, "Active Girls Who Drink Colas are Five Times More Likely to Fracture Bones", 16 June 2000, http://www.hsph.harvard.edu/ats/Jun16/june16_02.html
12. Wyshak G., R. E. Frisch, T. E. Albright et al., "Nonalcoholic Carbonated Beverage Consumption And Bone Fractures Among Women Former College Athletes", *J. Orthopedic Research* 1989; 7:91-9
13. Wyshak G. et al., "Carbonated Beverages, Dietary Calcium, the Dietary Calcium/Phosphorus Ratio, and Bone Fractures in Girls and Boys", *J. Adolescent Health*, 1994; 15:210, http://findarticles.com/p/articles/mi_m3225/is_n4_v50/ai_15752799
14. Tucker, Katherine L., Kyoko Morita, Ning Qiao, Marian T. Hannan, L. Adrienne Cupples and Douglas P. Kiel, "Colas, but not other carbonated beverages, are associated with low bone mineral density in older women: The Framingham Osteoporosis Study", *Am. J. Clin. Nutr.* 2006; 84:936-42, http://www.ajcn.org/cgi/content/abstract/84/4/936
15. "Regular Cola Consumption Linked to Lower Bone Density in Women", http://www.medscape.com/viewarticle/461898
16. Tufts University press release, "Consuming Cola May Up Osteoporosis Risk For Older Women", 6 October 2006, posted at http://www.emaxhealth.com/4/7732.html
17. Reinberg, Steven, "Cola Raises Women's Osteoporosis Risk: Caffeine might be the culprit, experts say", HealthDay, 6 October 2006,

children under 16 years, pregnant women and individuals sensitive to caffeine. Consumers should also be advised that caution be exercised in the consumption of stimulant drinks with alcohol or in association with sport, and the products should carry a clear statement on the label to this effect.

Branding for the wrong reasons

Sadly, young consumers of stimulant drinks still continue to mix these with alcohol and even other drugs. And why blame our youth when companies like Anheuser-Busch and Miller Brewing now produce several "energy beers"—beers containing caffeine. Red Bull—which has garnered 26.5 per cent of the US energy drink market measured by volume[44]—continues to be mixed with vodka, as mentioned in the Irish report, to make a "Friday Flattener" or a "Dirty Pompadour". Some drinks are named so as to attract their target audience: teens. Consider the example of the Cocaine Energy Drink which was launched recently: the name is suggestive and coined to draw a young clientele.[45]

... all consumers of energy drinks, whether young or old, ingest huge quantities of caffeine.

No wonder then that the energy drinks industry has grown to US$3.4 billion and is steadily rising. Simmons Research reports that 31 per cent of US teenagers say they drink energy drinks. This translates to 7.6 million teens, implying an increase of almost three million in only three years.[46]

Besides suggesting that these drinks quicken weight loss and offer instant energy, Dr McCarthy's aforementioned study indicates that young adults are attracted to energy drinks for the legal high they infuse when gulped down one after another.

Warnings on caffeine addiction

Kids don't really feel they're doing anything wrong. In truth, though, all consumers of energy drinks, whether young or old, ingest huge quantities of caffeine. Karen Birchard's article in the *Lancet* clearly states that the drinks have three principal constituents: caffeine, taurine and glucuronolactone. There is about 75 mg of caffeine in 200 mL of a stimulant drink, compared with about 21 mg in the same measure of a cola drink and 80 mg in a cup of filtered coffee. Now that stimulant drink-makers are offering bigger cans with higher caffeine content—perhaps as a drive to push sales—the caffeine intake is set to increase.

In fact, the CSPI has cited bigger serving sizes as a major reason for increased consumption. In the past 40 years, bottles and cans have ballooned from 6½ fluid ounces (fl. oz.) [192 mL] to 12 fl. oz. [355 mL] and recently to 20 fl. oz [591 mL]. Interestingly, back in the 1950s, Coke's "family size" bottle was only 26 fl. oz. [0.769 L]. The CSPI has dubbed 7-Eleven's 64-ounce [1.89 L], 600-calorie "Double Gulp" the "Pop Belly Special".[47]

Caffeine is associated with a number of health ailments: jitters, insomnia, high blood pressure, irregular heartbeat, elevated blood cholesterol level, vitamin and mineral depletion, breast lumps and birth defects are just a few. Caffeine is said to stimulate the adrenal gland such that when ingested in large amounts it can lead to adrenal exhaustion, especially in children.[48]

What consumers of both regular sodas and energy drinks should know, however, is that a Johns Hopkins University School of Medicine taste study in 2000 suggests that caffeine is added to soda in order to addict drinkers. The danger is that you wouldn't know you were slowly being addicted to caffeine. The research team found that only eight per cent of regular cola consumers detected a flavour difference at the caffeine concentration found in popular colas. Thus, the researchers concluded that "the high consumption rates of caffeine-containing soft drinks are more likely to reflect the mood-altering and physical dependence–producing effects of caffeine as a central nervous system–active drug than its subtle effects as a flavoring agent".[49]

http://www.hon.ch/News/HSN/535373.html
18. CSPI, "Soft Drinks Undermining Americans' Health: Teens Consuming Twice as Much 'Liquid Candy' as Milk", 1998, http://www.cspinet.org/new/soda_10_21_98.htm
19. CSPI, "Soft Drinks Undermining Americans' Health, op. cit.
20. Cohen, Ronnie, "Schoolhouse Rot", *Mother Jones*, 10 January 2001, reprinted at http://www.mercola.com/2001/jan/14/soda_dangers.htm
21. Critser, Greg, *Fat Land: How Americans Became the Fattest People in the World*, Houghton Mifflin, New York, 2003, quoted in Adams, Mike, "The health effects of drinking soda – quotes from the experts", 8 January 2005, http://www.newstarget.com/004416.html
22. CSPI, "Soft Drinks Undermining Americans' Health, op. cit.
23. Nestle, Marion, *Food Politics: How the Food Industry Influences Nutrition and Health* (book three in the California Studies in Food and Culture series) University of California Press, 2002, quoted in Adams, Mike, "The health effects of drinking soda", op. cit.
24. Valentine, Judith, PhD, CNA, CNC, "American Trends: The Dangers of Soft Drinks", http://www.ghchealth.com/soft-drinks-america.html; also see Doehrman, Marylou, "Marketing company brings business partners to schools", *Colorado Springs Business Journal*, 14 November 2003, at http://findarticles.com/p/articles/mi_qn4190/is_20031114/ai_n10044767
25. CSPI, "Soft Drinks Undermining Americans' Health", op. cit.
26. Valentine, "Soft Drinks", op. cit.
27. Cohen, "Schoolhouse Rot", op. cit.
28. Senator Patrick Leahy press release, 6 April 2001, http://leahy.senate.gov/press/200104/010409c.html; also see http://www.govtrack.us/congress/bill.xpd?bill=s107-745 http://leahy.senate.gov/press/200605/050306c.html
29. Valentine, "Soft Drinks", op. cit.
30. Environmental Working Group, "A National Assessment of Tap Water Quality, 20 December 2005, http://www.ewg.org/tapwater/findings.php
31. "The Street Fight", *Down to Earth*, 15 August 2006, http://www.downtoearth.org.in/cover.asp?FolderName=20060815&FileNAme=news&sid=70&sec_id=9
32. CSE, "CSE releases new study on pesticides in soft drinks", 23 November 2006, http://www.cseindia.org/misc/cola-indepth/cola2006/cola-index.htm
33. Valentine, "Soft Drinks", op. cit.
34. CDR (Commission on Dietetic Registration), http://www.cdrnet.org/wtmgmt/CertificateOfTraining.htm; WebMD, "Why Are Our Kids Overweight?", http://www.webmd.com/content/pages/18/101908.htm
35. Partnership for a Healthy West Virginia, "The Burden of Obesity", http://www.healthywv.com/data/burden_of_obesity.aspx; Schreiner, Barb, RN, MN, "Promoting Lifestyle and Behavior Change in Overweight Children and Adolescents with Type 2 Diabetes", *Diabetes Spectrum* 2005; 18:9-12, http://spectrum.diabetesjournals.org/cgi/content/full/18/1/9
36. Mercola with Droege, "The Real Dangers of Soda...", op. cit.
37. Simontacchi, Carol, *The Crazy Makers: How the Food Industry Is Destroying Our Brains and Harming Our Children*, Jeremy P. Tarcher, New York, 2000, quoted in Adams, Mike, "The health effects of

A 70-page letter and petition, submitted to the US Food and Drug Administration (FDA) on 31 July 1997 by the CSPI and based on more than 40 scientific studies, highlighted that caffeine, in addition to being an addictive substance, may cause miscarriage, insomnia and other problems.[50] The CSPI and prominent scientists from various universities including Johns Hopkins, Yale, Harvard, Duke, Michigan, California (Berkeley), and others as well as the Association of State and Territorial Public Health Nutrition Directors, the National Women's Health Network, the Boston Women's Health Book Collective and the Society for Nutrition Education urged the FDA to require the caffeine content of foods, including soft drinks, to be declared on labels. It appears that the FDA put the proposal on hold.

The CSPI filed another petition with the FDA on 13 July 2005, asking the agency to require health notices on a range of drinks,[51] and more recently is urging the FDA to enforce stricter standards for "energy" drinks and other so-called functional foods.[52]

The combination of caffeine and carbonation in soda pops also makes it a poor choice for people with intestinal problems.

Roland Griffiths, professor in the Department of Psychiatry and Behavioral Sciences at Johns Hopkins University School of Medicine, sums up the need of the hour quite well. His words are aimed at Americans but apply to all global citizens who are unaware of the potential outcome of caffeine: "Americans should be mindful about their caffeine consumption. Drinking the caffeine equivalent of several cups of coffee a day can lead to insomnia, anxiety, and difficulty concentrating. Ceasing the consumption of caffeine often leads to withdrawal symptoms, such as headache and fatigue. Caffeine is a mildly addictive drug, and parents might wish to limit their children's consumption of it."[53]

In her book *Food – Your Miracle Medicine*, health and nutrition expert Jean Carper warns women about caffeine. She says: "...those consuming at least one cup of a caffeine-containing beverage per day, such as coffee, tea or soft drinks, were more prone to PMS. And the more caffeine they consumed, the more severe their PMS symptoms."[54]

Likewise, Dr Gary Null's *Natural Living* radio show, focusing on power ageing, mentions a study on the relationship between caffeine and fertility which found that just one caffeinated soft drink per day was associated with a reduced monthly chance of conception of 50 per cent.[55] The combination of caffeine and carbonation in soda pops also makes it a poor choice for people with intestinal problems.[56]

The choice is yours

In a nutshell, the fact is that, every so often, medical professionals release research outcomes that cause a brief media buzz. Research studies involving carbonated beverages abound. It would be more appropriate, however, if, instead of a temporary interest in these outcomes as "new" stories for an ever-seeking media, the general population were stirred into action—to redefine and restyle their lives to incorporate the results of medical research, especially when the findings present a compelling case for lifestyle modification.

The choice is yours. Colas, energy drinks, etc., are yours for the asking. Once they have wreaked irreversible damage on your health, though, you will not be able to ask beverage companies to return your well-being. Think about it. ∞

About the Author:
Charu Bahri is an author and freelance writer living in India. She also works part-time for a charity in the health sector. Charu strongly advocates a simple, healthy lifestyle. Her article "The Ugly Truth about Beauty and Hygiene Products" was published in NEXUS vol. 14, no. 1. Charu may be contacted at charubahri@gmail.com.

drinking soda", op. cit.
38. Henkel, John, "Sugar Substitutes: Americans Opt for Sweetness and Lite", *FDA Consumer*, November-December 1999 (revised December 2004), http://www.fda.gov/fdac/features/1999/699_sugar.html
39. CSPI, "'Liquid Candy' Highlights", http://www.cspinet.org/sodapop/highlights.htm
40. American College of Emergency Physicians, "Caffeine Abuse Among Young People Discovered in Examination of Poison Center Calls", 16 October 2006, http://www.acep.org/webportal/Newsroom/NR/general/2006/101606b.htm
41. Johnson, Carla K., "Energy drinks wire youths, and experts see trouble: Misuse of the popular beverages is linked to health problems", Associated Press, 30 October 2006, http://seattlepi.nwsource.com/national/290422_energydrinks30.html
42. Birchard, Karen, "Irish concerned about health effects of stimulant soft drinks", *The Lancet* 356(9245):1911, 2 December 2000, http://www.thelancet.com/journals/lancet/article/PIIS014067360573470X/fulltext
43. Finnegan, Derek, "The health effects of stimulant drinks", *Nutrition Bulletin* 2003; 28(2):147-155, http://www.blackwell-synergy.com/doi/abs/10.1046/j.14673010.2003.00345.x?journalCode=nbu
44. Ward, Andrew, "A case of can do: Red Bull is on a roll", 11 November 2005, http://www.theaustralian.news.com.au/story/0,20867,17204119-27654,00.html
45. Mason, Michael, "The Energy-Drink Buzz is Unmistakable. The Health Impact is Unknown", 12 December 2006, http://www.drinkcocaine.com
46. Johnson, "Energy drinks wire youths...", op. cit.
47. CSPI, "Soft Drinks Undermining Americans' Health", op. cit.
48. Mercola with Droege, "The Real Dangers of Soda...", op. cit.
49. Cohen, "Schoolhouse Rot", op. cit.
50. CSPI, "Label Caffeine Content of Foods, Scientists Tell FDA: Health Activists Say Caffeine Causes More Than a 'Buzz', 31 July 1997, http://www.cspinet.org/new/caffeine.htm
51. CSPI, "CSPI Calls on FDA to Require Health Warnings on Sodas", 13 July 2005, http://www.goodnutrition.org/new/200507131.html
52. CSPI,"FDA Urged to Stop Claims for 'Energy' Drinks", 5 December 2006, http://www.cspinet.org/new/200612051.html
53. CSPI, "Label Caffeine Content of Foods", ibid.
54. Carper, Jean, *Food – Your Miracle Medicine: How Food Can Prevent and Cure over 100 Symptoms and Problems*, HarperCollins, New York, 1993, quoted in Adams, Mike, "The health effects of drinking soda", op. cit.
55. Null, Gary, quoted in Adams, Mike, "The health effects of drinking soda", op. cit.
56. Tresca, Amber, "Avoid Carbonated Beverages", http://ibdcrohns.about.com/od/irritablebowelsyndrome/qt/ibstip19.htm
57. Zimmerman, Marcia, *The ADD Nutrition Solution: A Drug-Free 30-Day Plan*, Henry Holt & Co., New York, 1999, Adams, Mike, "The health effects of drinking soda", op. cit.
58. "What I need to know about Kidney Stones", http://kidney.niddk.nih.gov/kudiseases/pubs/stones_ez/#avoid